SCIENTIFIC TEMPERANCE

MONTHLY ADVICES.

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Scientific Temperance

MONTHLY ADVICES.

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ENTERED AT THE POST OFFICE AT HYDE PARK AS SECOND CLASS MATTER.

If the teacher keeps clearly in mind the object to be attained as the result of the study of Physiological Temperance, the possibility of realizing that object is greatly enhanced.

The child, the central figure in all education, is the subject of our thought here; and that the child shall make the right kind of a man or woman, is the object sought.

The ideal man or woman is a being with a sound, right-thinking mind, in a strong, active and healthy body.

If the teacher holds up this ideal before her pupils as the type to which they must grow, then the study of the relation of right physical habits and of the nature and effects of alcoholic drinks, tobacco and other narcotics upon those habits will be seen by the pupil in their true light. This we may expect will be effective in influencing subsequent life. But only truth about those substances should be taught and no attempt made to prove a case.

The development of the child's faculties of observation in search for truth, and of comparison and reasoning concerning that truth, as well as of memory, is in the line of true education. In no study can these faculties find a better opportunity for such development, than in this if rightly pursued. But we repeat, the object to be attained in the case of each child and the method for the school to use for securing it must be definitely in the mind of the teacher.

As we write this we realize that the child may be surrounded by

many counteracting influences that the school cannot control; we are not forgetting the laws of heredity that are working for good or for ill in each pupil, but just so sure as light will dispel darkness, as truth will correct error, so surely will sound teaching on this topic influence the future men and women of this land. We may not thereby save all, but we may expect to save a majority and that majority will be the law-making power of the to-morrow in our Republic.

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The perpetuity of our Republic depends upon the capacity of its people for self-government. Alcoholic drinks destroy this capacity and are the greatest enemy to the Republic.

The teacher who is faithfully teaching the truth against alcohol, tobacco and other narcotics, who is thereby pre-empting young lives to abstinence from them, is in that work a flag-defender. It is most fitting that the stars and stripes, with all they mean, should float over such teachers and pupils.

If the drink-habit is fastened upon a boy, his future money-earning power is thereby mortgaged to the brewer and distiller and his nobler nature to dishonor and degradation. The study of Scientific or Physiological Temperance, rightly taught and pursued, will set up the danger-signal before the first steps that lead to such habits.

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It is an established educational principle that "The teacher must know the subject matter to be taught and its relations to other subjects."

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We send to all our subscribers with the February ADVICES a Schedule of Courses of Study in Physiology and Hygiene, with special reference to the nature and effects of alcoholic drinks and other narcotics, for graded and ungraded schools. This Schedule contains lists of all the approved and endorsed temperance physiologies arranged in series adapted to schools having a varying number of years below the high school.

WHY TEACH FERMENTATION?

Education has for its end two objects,—to develop human faculties and to acquaint the human being with its environment.

The study of Physiology and Hygiene is important chiefly for the latter purpose, though by no means deficient in material for mental culture as well.

To know that the air we breathe is made up mostly of two gases, oxygen and nitrogen, is knowledge of environment, but it is of far less consequence than to know when air is unfit to breathe. The most

necessary knowledge of environment is that which will help us to form hygienic habits, to make the most of ourselves, mentally, morally and physically.

We study Physiology that we may understand the rules of Hygiene. Those we need most to understand are those we are most tempted to break, and those which, when broken, are followed by the direst consequences.

Few if any hygienic laws carry more serious penalties than those which are transgressed in the use of alcoholic liquors or tobacco.

Popular fallacies concerning the origin and nature of alcoholic drinks are largely responsible for first indulgences that lead to the formation of drink habits. Among these are:

1. The mistaken idea that because fruits and grains are wholesome and nutritious, the alcoholic liquors made from them are wholesome and nutritious also.

2. That there is alcohol in everything, hence it cannot be very harmful.

3. That alcoholics are a provision of nature and hence not to be slighted.

A study of fermentation dispels these errors. It shows:

1. That fermentation entirely changes the character of the substances fermented.

2. It shows the conditions essential to the process of alcoholic fermentation, pointing out where alone it may be expected to take place; why not in the interior of fruit, grains or vegetables, why not in closely canned fruit juices or in preserved fruits?

3. It reveals the fact that unless man intervenes, other processes of decay take the place of vinous fermentation, and in so doing provide no alcoholic liquors for man's use as a beverage.

Thus, so much of fermentation as will correct the erroneous notions which tend to wrong habits, becomes a part of the study of hygiene.

FERMENTATION LESSONS IN THE PRIMARY GRADES.

At a meeting of the primary teachers of a large city not long ago, all present who had known of children in the first year of school coming into their classrooms unfitted for work from the effects of beer or other liquors given them at their homes, were asked to raise their hands. About twenty-five teachers thus testified to instances coming under their personal knowledge.

No stronger argument than this could be asked to show the

nced of beginning to teach the reasons for avoiding the use of these substances to even the very youngest children in school.

Only the simplest facts, however, underlying these reasons should be presented, and the method of presenting them should be most carefully shaped to the end to be accomplished.

With the very youngest children the object sought is to lead them to understand the change that takes place in fruit juices when they have been pressed out and left in conditions favorable to fermentation.

The following are suggested as examples of such simple facts :

1. There are ferments in the dust on the outside of grapes.
2. There is sweet juice inside of grapes.
3. When the juice is pressed out of grapes ferments get into it.
4. Ferments soon change the sweet juice and leave a poison in it.
5. We should not drink grape juice that has been changed by the ferments.

The following is suggested as a method of developing the above facts :

Provide a bunch of grapes. Give one grape to each pupil. Ask them to look carefully at the outside of the grape and tell you what they see on the skin. Describe the particles of dust, so small that we cannot see every little particle, but only the coating produced by numbers of them. Explain that among these fine particles are some so very small that we cannot see them at all without a magnifying glass that makes them look very many times larger than they really are. Draw a picture on the board showing their form, and tell the children that these tiny things in the dust on the outside of grapes are called ferments. Let the children restate what you have told them.

Tell the children to squeeze the grapes lightly and see what comes out ; to taste this juice and tell how it tastes. Let them tell what is inside the grape.

Take up several of the grapes and press them until the juice runs out. Let the pupils see that the juice is running out over the dust on the grapes. Question to bring out the fact that the dust and the ferments in the dust get into the juice as it is pressed out. Then let the children state what happens when the juice is pressed out.

Tell about the way men make wine, the big vat with a great quantity of grapes in it and how the grapes are crushed and the juice runs out and down into the vat, and let the children tell what gets into the juice as it runs out over the skins of the grapes.

Then tell them that after the ferments have been in the juice a short time they begin to change it so that it loses its sweet taste and soon has a poison in it. It is then called wine.

The teacher should explain and question carefully to be sure that these little ones do not get an exaggerated idea of a poison in this case, but the true thought of it as a substance that will injure us if we take a little and can kill if enough is taken.

Let the children tell what they think about drinking grape juice that has been changed in this way by the ferments.

It is possible that some child will here volunteer the information that his father or mother drinks wine. Discourage any such allusion to the pupils' parents by keeping the thought on the question itself. Ask what is in the wine that is not in the grape juice when it is in the grapes. Ask the child why *he* would rather have the juice as it comes from the grape than after the ferments have changed it. Tell him that we shall learn more about this poison in the wine and the harm it does to people, as we study more about it.

Do not let the children get the idea that the ferments will hurt us as we get them when we take fresh ripe grapes into our mouths to eat. Then tell them that a ferment is not a bug or a worm but a plant so small our eyes cannot see it. That it can do no harm unless it is washed into the pressed out grape juice, when it will make alcohol.

FERMENTATION LESSONS IN LOWER INTERMEDIATE GRADES.

Pupils should begin to glean information on this topic from books as soon as they are able to use books in other branches.

This lesson for intermediate grade pupils is offered as suggestive of a rational way of using text-books on this topic, and otherwise guiding the pupils' investigations in the discovery of the facts in the case.

In the primary grade lessons the children learn that a change takes place in expressed fruit juices allowed to ferment. In the next grade they learn something more of these changes, and the conditions under which they take place.

The teacher looks over the text of the lesson in advance and finds (if the books in use contain an adequate treatment of the subject, she will find) the following points, which she notes down as the ones it is important to have stand out in the children's minds after they have been over the lessons:

1. Ferments are very minute plants found on the outside of the fruit, they have no roots or teeth or power of any kind with which to penetrate the skin, hence,

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his own, we have aroused his mental activity, we have interested him in that subject.

Try the following questions, placed upon the board in advance of the lesson:

1. On what part of the fruit are the ferments found? Why are they not found inside? Why do we get no alcoholic fermentation inside of whole fruit?

2. Why do ferments change the sugar of a sweet liquid, when submerged in it? Where do they get their oxygen when in a shallow liquid close to the air?

3. Why are canned fruits put into jars and sealed while hot?

4. Why are jams and jellies less liable to spoil than canned fruits if exposed to the air?

5. What else do ferments do when in a sweet liquid, besides break up and change the sugar? How does moderate warmth affect them? How soon may we look for alcohol in sweet cider?

6. Why is the juice of apples and grapes good when the fruit is eaten, and bad when it is pressed out and made into cider or wine?

7. What is the special danger to the drinker of the small amount of alcohol found in fermented liquors?

Note. "It is the nature of alcohol to create in one who takes it a desire for more. This is as true of small quantities as of large. Alcohol has the power to create an appetite which will lead a man to sacrifice health, property, ability to work, the respect of his friends, and everything that makes life worth living, for the sake of obtaining drinks that contain the deadly poison. This is called the alcoholic appetite. This appetite is not like the ordinary appetite for food. It is a diseased craving, the result of injuries that the alcohol itself has caused."— Blaisdell's "Physiology for Boys and Girls," p. 57.

8. Is fermentation never a benefit when used in preparation of food?

Note. "We must not conclude that fermentation is never a good thing. If it is stopped at just the right point, and the alcohol all driven off by heat, it improves some kinds of food.

"Grain made into flour is a food; but, in this form, it is not suitable to eat. Yeast added to warm, moistened flour causes fermentation. A little sugar in the flour itself (called free sugar) turns to alcohol and carbonic acid gas. This gas, in a thin liquid, would pass off into the air. But it is imprisoned by the sticky dough, and puffs it up with little cells in its effort to escape, thus making the otherwise solid mass light and spongy.

"The small quantity of alcohol which was formed, turns to vapor by the heat of the oven, and passes off into the air; a light, sweet loaf of bread is left, which is better food than the flour."— "Young People's Physiology," p. 56.

The children should be told where to look for light on these

questions. For the first they may examine the whole fruit very carefully and try to think out the answer. For the second they may go to their books. The third and fourth may be asked about at home, but information thus obtained must be carefully examined, as it may be as much folk-lore as fact. For the fifth, sixth, seventh and eighth they may consult their books.

When the time for the recitation arrives, the teacher will let the children tell what they have been able to find out, correct any misconceptions, add further facts if necessary, or tell them how they can find answers to further questions, if any arise. Then will follow recapitulation, with questions to draw out the form of statement desired, and subsequent reproduction in a written exercise.

The teacher, in giving these lessons, should never lose sight of the fact that the object to be attained is to guide the pupil to understand the dangerous character of beverages that have undergone vinous or alcoholic fermentation, and to show how these at first harmless fruit juices become so dangerous. The point of the lesson is lost if this impression is not the chief one left upon the pupil's mind.

FERMENTATION LESSONS IN ADVANCED GRAMMAR GRADES.

This study should be so well graded, and is in the endorsed text-books, that successive classes will each get such an advanced and enlarged treatment of the subject as will keep it ever fresh and interesting. Advanced grammar grade pupils are able to grasp points of interest that were beyond younger pupils. A few of these are here suggested, as,—

1. Ferments are most abundant at the season of the year when fruits are ripening.

M. Pasteur has tried numerous experiments to find out the time of year when the ferments appear on the surface of the grapes. He says, "As long as the grapes were green, about the end of July and during the first fortnight in August, we obtained no fermentation in our must" (that is to say, in the juice obtained from the unripe grapes).— Pasteur's "Studies in Fermentation."

2. That the germs can exist for a long time in a dry state when they are carried about by the air.

"Before they are found in the must of wine or fruits, the ferments fasten in a dormant state on the epidermis of the fruit, by which means they are introduced into the liquid about to be fermented. The spores are transported through the air until they rest on the downy surface of a drupe or berry. . . . . These spores may remain undeveloped for a long while, may become perfectly dry, and may even be

subjected to a very high temperature, without losing the power of germination when they are again placed in conditions favorable to their development."— Trouessart's "Microbes, Ferments and Moulds."

3. That the ferments are more abundant in the vicinity of ripening fruits than elsewhere.

"The observations of Pasteur and E. Hansen have brought to light some peculiar arrangements in the life of the *Saccharomycetes* which excite alcoholic fermentation when growing spontaneously, though these arrangements are not yet quite intelligible. According to the careful investigations of the latter writer, *Saccharomyces Apiculatus* appears in the open air on garden fruits containing sugar as soon as they are ripe, and if it has shown itself on early ripening fruits, such as currants, gooseberries or cherries, it is wanting on others which ripen later, plums and grapes for instance, as long as they are still green. In the interval between two periods of ripening of the fruit, even in winter, it is found capable of development in the soil beneath the plant whose ripe fruit it attacks, and very rarely in any other place."— DeBary's "Morphology and Biology of the Fungi, Mycetozoa and Bacteria."

Pasteur says, at the conclusion of a series of careful experiments ("Studies in Fermentation," p. 159), "It seems possible, therefore, that the germs of fermemt may not exist on bunches of sound grapes during winter."

4. The rapidity with which ferments multiply.

"On October 12, 1881, at 10 o'clock in the morning, we crushed some grapes without filtering the juice that ran from them; afterward, at different times during the day, we examined the juice under the microscope, until at last, although not before 7 o'clock in the evening, we detected a couple of cells. From that time we kept these contiguous cells constantly in view. At 7.10 we saw them separate and removed to some little distance from each other. Between 7 and 7.30 we saw on each of these cells a very minute bud originate and grow, little by little. At 7.45 the buds had increased greatly in size. By 8 o'clock they had attained the size of the mother cells. By 9 each cell of each couple had put forth a new bud. We did not follow the multiplication of the cells any further, having seen that in the course of two hours two cellules had furnished eight, including the two mother cells. An increase like this, which would have been more rapid at a higher temperature, may, indeed seem surprising. It is really, however, nothing to what sometimes occurs."— Pasteur's "Studies in Fermentation."

It then remains to show that alcoholic fermentation, though akin to the natural process of decay, is a *perversion* of the same, due to man's intervention, and hence alcoholic liquors cannot be called a provision of nature.

Also to trace the law of fermentation, the data of which began to be studied in the primary grade.

Begin by asking the pupils why a rock on damp ground will remain

unchanged, while a fallen tree in the same place will crumble, decay and go to pieces. Lead them to observe what Pasteur puts thus forcefully:

"All that has lived must die, and all that is dead must be disintegrated, dissolved or gasified; the elements which are the substratum of life must enter into new cycles of life. If things were otherwise, the matter of organized beings would encumber the surface of the earth, and the law of perpetuity of life would be compromised by the gradual exhaustion of its materials."

Lead the pupils to see that the tree, once alive like all organic matter, has its own organisms that will cause it to decay or fall to pieces as soon as it is dead. Show that the rock, never alive, not an organic body, is not subject to this law of decay.

Pupils of this grade are supposed to understand what is meant by organic and inorganic matter.

Organic matter is matter "pertaining to objects that have organs; hence, pertaining to the animal and vegetable worlds. The term *organic*, as applied to any substance, in no way relates to the presence or absence of life. The materials which compose the living body are of course *organic* in the main, but they are equally so after death has occurred—at any rate for a certain time—and some of them continue to be so for an indefinite period after life has departed. Sugar, for example, is an organic product; but in itself it is of course dead, and it retains its stability after the organism which produced it has lost all vitality."—Century Dictionary.

Ask what becomes of a bunch of grapes or an apple left hanging on the vine or tree. Let the pupils give its history as they have observed it. Ask what name is given to the series of changes through which the grape or apple passes.

"Imagine that you hold in your hand a bunch of ripe grapes just picked from the vines. Upon the surface of each grape is a thin coating of dust, called its 'bloom,' that can be rubbed off. This dust, if examined with a microscope, will be found to contain germs of both moulds and ferments. If the grapes are left to themselves the moulds will, in time, cause them to decay or rot; but if the grapes are picked, and their juice is pressed out, this juice is caused to decay by the ferments."—"Physiology and Health: Number Three" (Union Series).

Ask the pupils to name other substances in which they have observed this process of decay. Let them bring samples of these to school for examination. Procure the strongest microscope possible, and let the specimens be examined under it.

The following questions and directions might be given out, or placed upon the board to guide the pupils in their search, to show them what to look for and where to look. They should be taught to

consult books for information they can not obtain by careful observation:

1. Why is it difficult to keep fresh ripe fruit all the year around?

2. Mention the best ways of preserving whole, sound fruit, and state why.

3. Mention other substances besides fruit which will not keep.

4. Set away a quantity of sweet milk in a cup. Examine it every day and keep a record of observations.

5. Put a piece of bread in a cool, dry place, another in a warm, moist place (shut up in a close tin box where the moisture will not evaporate) and keep note of observations.

6. Treat a piece of cheese in the same way, also pieces of vegetables, as squash, melon, etc.

7. Under what conditions does decay go on most rapidly?

8. What causes decay?

9. What would be the condition of the world if nothing ever decayed?

10. What causes the decay of fallen trees? Where do they decay most rapidly?

11. What causes decay in fruits? What causes the decay in fruit juices when they are pressed out? Which is the natural process?

12. State the difference between the condition of the apple (with reference to its use by man) before it begins to decay and afterward. Compare bread, cheese, vegetables and meat in the same way.

13. State the difference between fruit juices when they are first pressed out, and after they have fermented. What is in the fermented juice that was not in the fresh juice?

14. Mention various kinds of fermentation. What law of fermentation holds good through all?

Notes for Reference.

The following gleanings on the above points may be used as needed to assist in the investigation. They are numbered to correspond with the questions.

1. "A living organism dies — animal or plant, or the remains of one or the other. It is exposed to the contact of the air. To the life which has quitted it succeeds life under other forms. In the superficial parts, which the air can reach, the germs of infinitely small ærobies (micro-organisms which cannot live without free oxygen) hatch and multiply themselves. The carbon, the hydrogen and the nitrogen of the organic matters are transformed by the oxygen of the air, and, under the influence of the life of these ærobies, into carbonic acid, vapor of water and ammonia gas. As long as organic matter and air are present, these combustions will continue. While these superficial combustions are

going on, fermentation and putrefaction are doing their work in the interior of the mass by the developed germs of the anærobies, which not only do not require oxygen for their life, but which oxygen actually kills. Little by little, at length, by this work of fermentation and slow combustion, the phenomenon is accomplished. Whether in the free atmosphere or under the earth, which is always more or less impregnated with air, all animal and vegetable matters end by disappearing." —"Louis Pasteur; His Life and Labors," p. 65.

2. "In the canning of fruits, the boiling fruit is placed in cans which are at once tightly sealed. Why do not these canned fruits decompose? Because the heat first applied to them destroys all the micro-organisms, and because no others can gain entrance from without the tightly sealed vessels."— Stowell's "Essentials to Health."

"Expose milk to the air. It will, after a time, turn putrid or sour, separating, like blood, into clot and serum. Place a drop of such milk under a microscope and watch it closely. You see the minute butter globules animated by that curious quivering motion called the Brownian motion. But let not this attract your attention too much, for it is another motion that we have now to seek. Here and there you observe a greater disturbance than ordinary among the globules; keep your eye on the place of tumult and you will probably see emerging from it a long, eel-like organism, tossing aside the globules and wriggling, more or less rapidly across the field of the microscope. Part of the change wrought in the milk is due to this organism, which, from its motions receives the name of *vibrio*. In curdled milk you find other organisms, small, motionless and usually linked together like beads on a string. It is these which cause the milk to separate into clot and serum. They constitute the lactic ferment of milk, as the yeast plant does the alcoholic ferment of sugar. But milk may become putrid without becoming sour. Examine putrid milk microscopically, and you find it swarming with shorter organisms, sometimes associated with the *vibrios*, sometimes alone, and often manifesting a wonderful alacrity of motion. Keep these organisms and germs out of your milk and it will never putrify."—Tyndall's "Floating Matter of the Air."

6. "Place an old boot in a moist place, or expose common paste or a pot of jam to the air; it soon become coated with a blue-green mould, which is nothing else than the fructification of a little plant called *Penicillium glaucum*. Do not imagine that the mould has sprung spontaneously from boot or paste or jam; its germs, which are abundant in the air, have been sown, and have germinated in as legal and legitimate a way as thistle seeds wafted by the wind to a proper soil. . . . A cut apple, a pear, a tomato, a slice of vegetable marrow or, as already mentioned, an old moist boot, a dish of paste or a pot of jam constitute a proper soil for the *penicillium*." — Tyndall's "Floating Matter of the Air."

8. "What causes all these various processes of decomposition? Are plants and animals so constructed that when they have served their purpose they fall to pieces of themselves, or from the action of the air, as was once supposed? No: the microscope has introduced us to whole tribes and families of minute living forms whose special work is to cause

this decomposition of the dead bodies of their neighbors." — Blaisdell's "Young Folk's Philosophy."

9. "Were it not for these (the organisms that cause decay) the whole surface of the earth would in time be covered with dead trees and other lifeless bodies, and there would be no simple substances left out of which to build up new ones." — Blaisdell's "Young Folk's Physiology."

10. "Berkley states that immediately after the death of any vegetable substance, an army of fungi of various kinds is at hand to complete the work of decomposition. The soft tissues are rapidly reduced to a semi-fluid condition by the combined action of putrefaction and of these fungi. The hardest wood yields to the same agents, not, indeed, so quickly, yet much more rapidly than would be the case from the action of the constituents of the atmosphere alone. When a log of one of our finest trees is attacked by fungi it soon becomes only a mass of rotten wood, of which the woody tissue has been traversed and destroyed by the mycelium. If the same log were merely subjected to the action of the weather it might endure for half a century before becoming completely rotten." — Trouessart's "Microbes, Ferments and Moulds."

11. "*Mucor mucedo,* and other species of the same genus, form the small, downy tufts of a grayish-white color which may be observed on mouldy bread, rotten fruits, etc. . . . On rotten fruits, the spores of these fungi germinate in five or six hours by introducing hyphæ (the filament or thread of a fungus) through the epidermis. *Sleepiness,* which is only the first stage of rottenness, is, according to Davaine, to be ascribed to the action of these fungi. Fruit in this mouldy condition is sometimes unwholesome." — Trouessart's, "Microbes, Ferments and Moulds."

"If a plum covered with the velvety down mentioned above be lightly shaken over a piece of glass, and the glass put under a microscope, it will be found that a great many of the spores have fallen away from the threads. It is by means of these spores that the disease spreads. The wind blows them all through the orchard, many falling upon healthy plums, where they germinate by sending forth a minute tube which enters the fruit. Once inside the fruit, this tube continues to develop into *mycelium* which penetrate all the tissues of the plum and causes it to turn brown. This *mycelium* eventually develops a crop of spores and causes the plums to become withered and dry and to remain upon the trees in a mummified or dry condition. In this way the fungus stays on the trees all winter, and even until the next year's crop of fruit ripens." — "American Garden," March, 1890.

"When apples are ground to make cider, or grape juice is pressed out to make wine, the ferments resting on their surfaces are washed into the expressed juice. Each ferment rapidly produces others, unless the liquid is kept at a very cold temperature, and all begin to break up the sugar of the juice.

"Two substances set free by this decomposition of the sugar are carbonic acid gas, which may be seen coming up out of the cider o

grape juice in tiny bubbles, and alcohol, a poison which remains in the liquid.

"The whole nature of the fruit juice which was wholesome and beneficial before this fermentation took place is now changed by the presence of the alcohol. It becomes a poisonous liquid called cider, if made from apple juice; wine if made from the juice of grapes, berries, currants and other fruits."—Blaisdell's "Young Folk's Physiology."

QUESTION BOX.

Correspondence on any and all phases of the subject represented by this Department is cordially invited.

A teacher writes: "I know I am not teaching Temperance Physiology as I ought, but what can I do to mend matters? I do not very well understand the subject and the text-books provided by the school directors are chiefly physiology with little or nothing that I ought to teach about alcoholic drinks or tobacco; but I feel helpless in the face of my opportunity and obligation."

To this teacher we reply: To waken a spirit of enquiry, to rouse the pupil's curiosity in the topic taught, is one of the first principles in education; and the next is to guide his search for truth concerning it through all possible avenues of information. The prescribed text-books should be one of these avenues. These books should not only contain statements of the truth to be taught and stimulate search for proof of same, but the whole should be told in language well adapted to grade.

To say that such text-books are pre-eminently essential for a new study, in which the teacher has had no special training as to facts to be taught or methods of teaching, is not saying that the text-book is to be used only after the old-dry memorizing method. Such an inference is a perversion. Let such text-books be used with the illustrative, objective methods that are employed in modern teaching as in the case of other subjects.

But just what can this teacher do in the circumstances in which she is placed?

If she will send to us (see address on first page) stating the grade of pupils she is teaching, we will ask some one of the many publishers to send her free, sample copies of approved text-books.

If she finds these books meet her needs, and is able to secure their adoption for her class or school, one important avenue of information will be open, both to her and her pupils.

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